

<http://proteomics.cancer.gov>



CLINICAL PROTEOMIC
TECHNOLOGIES FOR CANCER



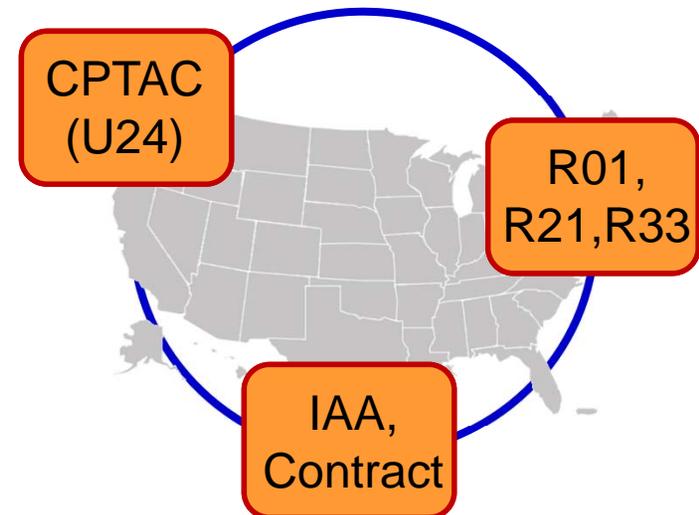
CPTC: Additional Highlights

Henry Rodriguez, PhD, MBA
Director, CPTC

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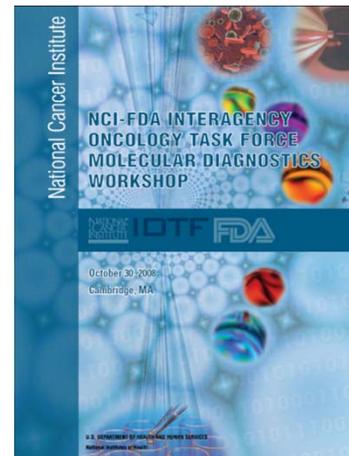
CPTC: Additional Highlights

1. Clinical Proteomic Technology Assessment for Cancer (CPTAC) Network (U24)
 - FDA – development of prototype 510k
2. Advanced Proteomic Platforms and Computational Sciences (R01, R21, R33):
 - Data analysis and sharing
 - Technology development
3. Reagents and Resources Core (IAA & contract):
 - High quality reagents (protein and antibody reagents)



CPTAC (U24): Working with FDA to Enable Bridge Technology

- MOU - 2006
- Interagency Oncology Task Force workshop - 2008
- Goal:
 - Identify analytical validation needs for proteomic technologies in the context of intended use.
 - Multiplex mass spec (MRM)
 - Multiplex affinity array
- Deliverables:
 - White paper
 - Two mock 510k pre-applications that serve as guidance documents to the proteomics community



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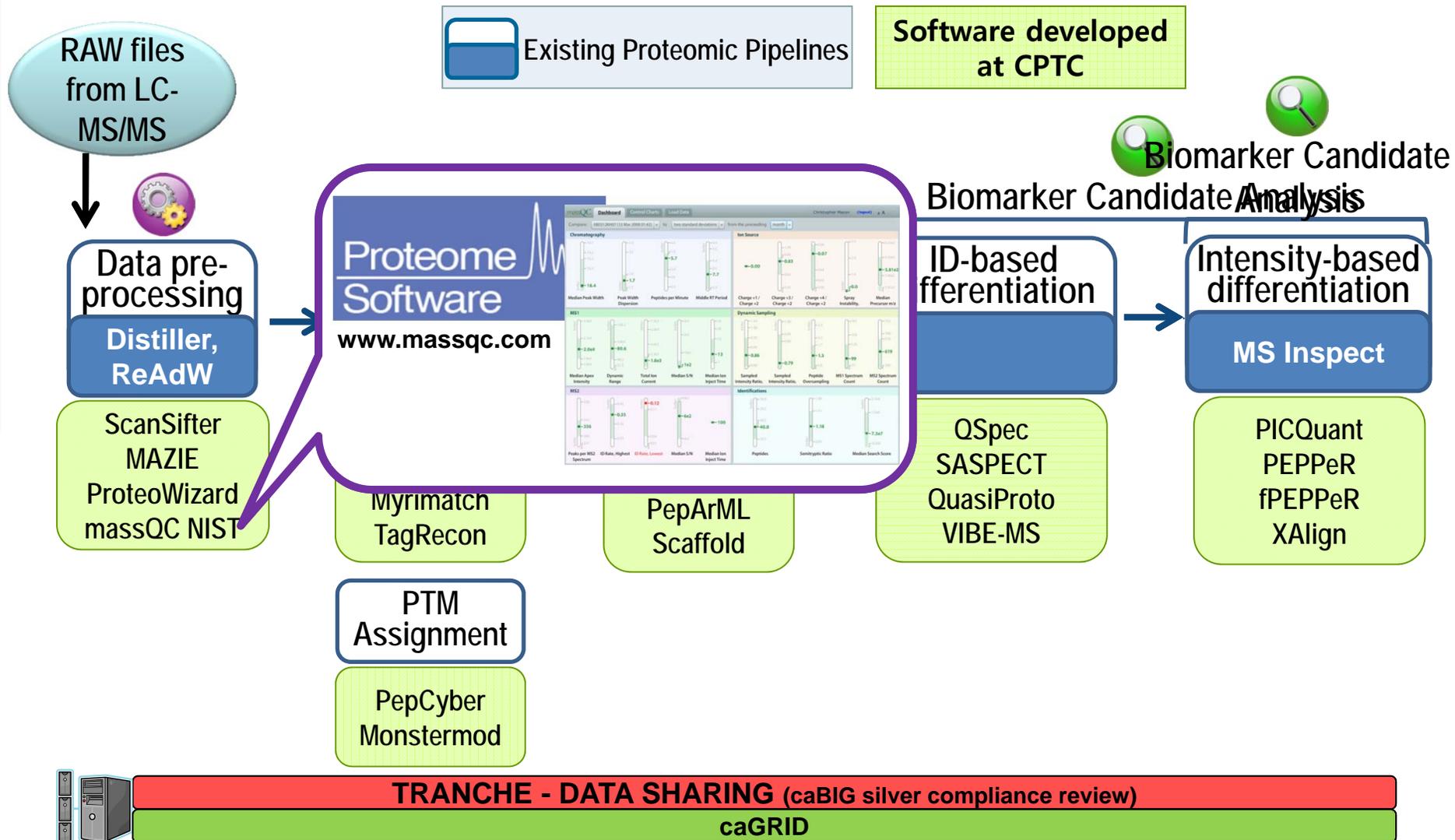


October 30, 2008

"There's really no guidance for multiplex proteomic assays. There are unique issues when you start to do a multiple test in a single tube or platform."

Elizabeth Mansfield, Ph.D., Senior Policy Analyst, Office of In Vitro Diagnostic Devices, FDA

R01: Data Analysis and Sharing (discovery-stage technologies)



R01: Data Analysis and Sharing (verification-stage technologies)



Existing Proteomic Pipelines

Software developed
at CPTC

RAW files
from LC-
MS/MS



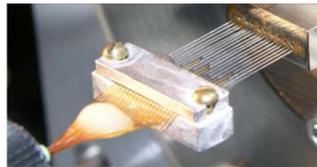
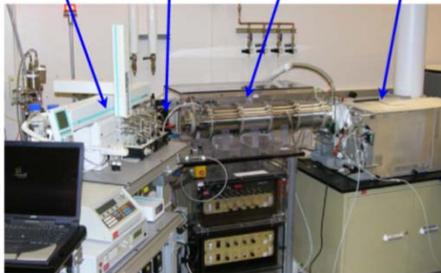
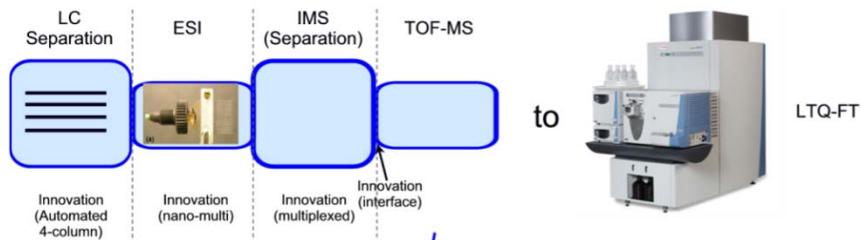
- **Total of 26 computational tools developed
(for discovery- & verification-stage technologies)**
- **Community Data Sharing
(TRANCHE - caBIG silver compliance review)**

TRANCHE - DATA SHARING (caBIG silver compliance review)

caGRID

R21, R33: Technology Development (examples)

Mass Spec Technology



- Sensitivity: >10-fold
- Throughput: >10-fold
- Dynamic range: improvement w/ 50% reduction in CV values

Dr. Richard Smith, Pacific Northwest National Laboratory

Biochip Technology

- Evaluation of phosphopeptides to SH2-binding domains
- Prototype

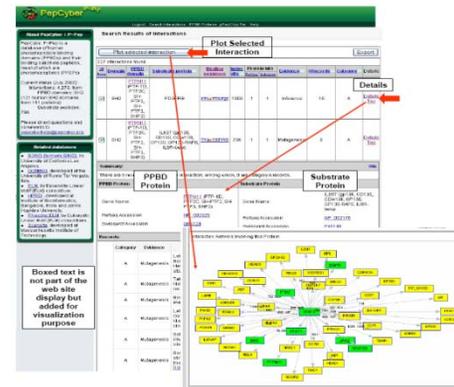
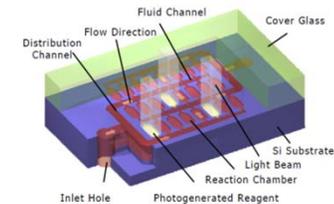
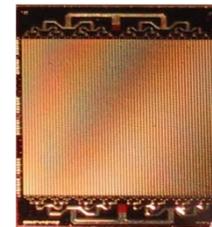
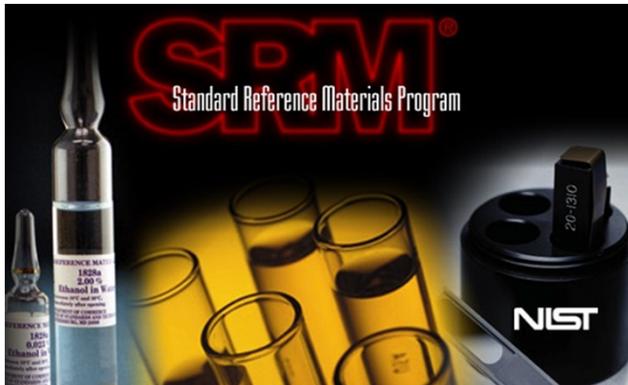


Figure 1. PepCyber web search result page. Login information: <http://pepcyber.uconn.edu/PepCyber> and temporary login using rnh and key=mb123. Database search allows "Interactions", defining "Domain", or "peptide". The representative research results are shown above.

- Public database of designing phosphopeptides to human SH2-binding domains

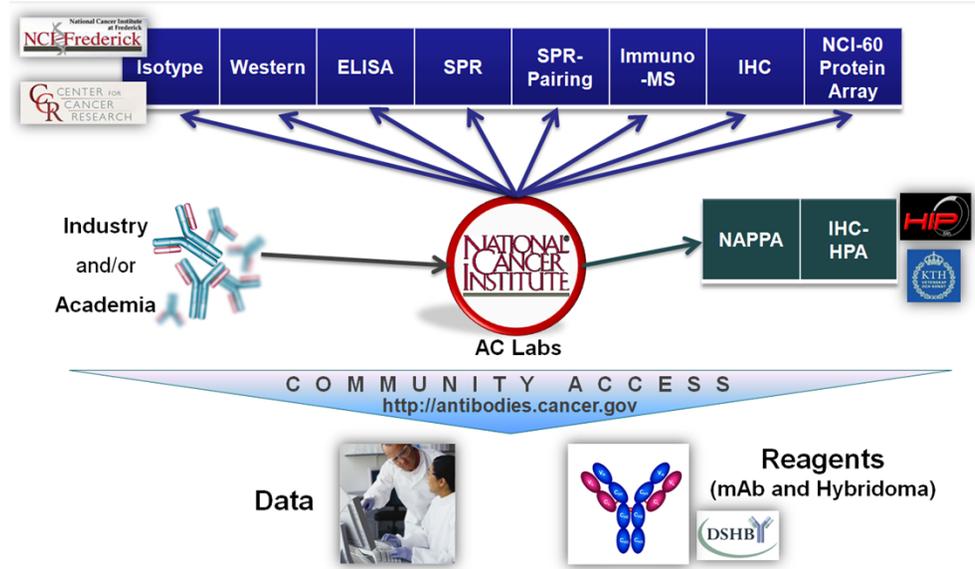
Dr. Xiaolian Gao, University of Houston

IAA & Contract: Reagents & Resources



- Reference Materials
 - Yeast lysate (SRM 3953)
 - Peptide mixture (SRM 3592)
- Standards Kits
 - Discovery LC-MS/MS
 - Verification MRM
- Labeled cancer-specific proteins – 120 proteins (and expression vectors)
- 2.5 year

NCI mAb Characterization Program



- Highly-characterized mAbs (10 assay process)
- SOP driven
- 3 mAbs per antigen
- >77 mAbs available
- hybridomas
- MTAs in dev.
- 1 year

Resources

CPTAC data sets; SOPs; Software tools; Best practice/FDA documents

CPTC: Program-Wide Highlights

- Data release
- Strategic alliance with scientific organizations
- Leveraged activities

Strategic Alliance with Scientific Organizations

American Association for Cancer Research

- 2009: Educational workshop at annual meeting
- 2010: Symposium session in planning

American Association for Clinical Chemistry

- 2008: - Plenary talks
- 2009: - Clinical article
- Plenary talk
- Joint workshop
- 2010: - CLN special issue
(edited by Anderson,
Carr, Hortin)
- Workshops
- MOU

American Society for Mass Spectrometry

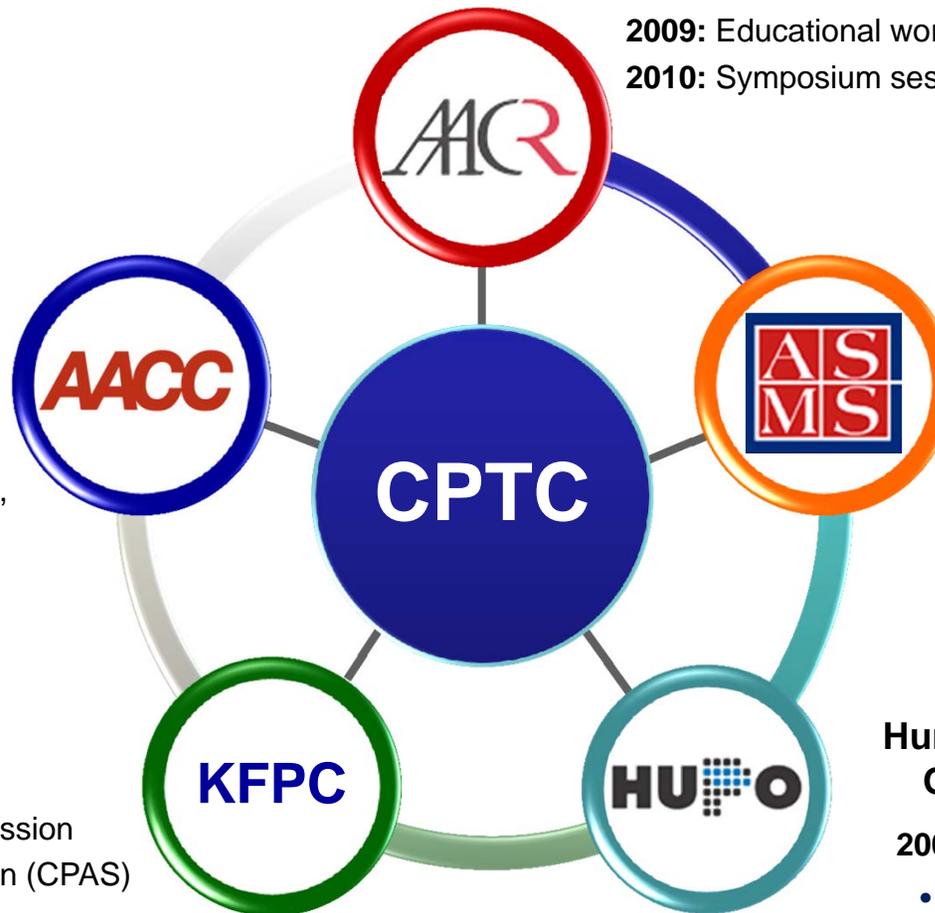
- 2008: Methods workshop
- 2009: Plenary session

Korean Functional Proteomics Center

- 2007, 2008: - Plenary session
- 2009: - Software adoption (CPAS)
- MRM adoption
- MOU

Human Proteome Organization

- 2006, 2007, 2008, 2009
- CPTAC workshops

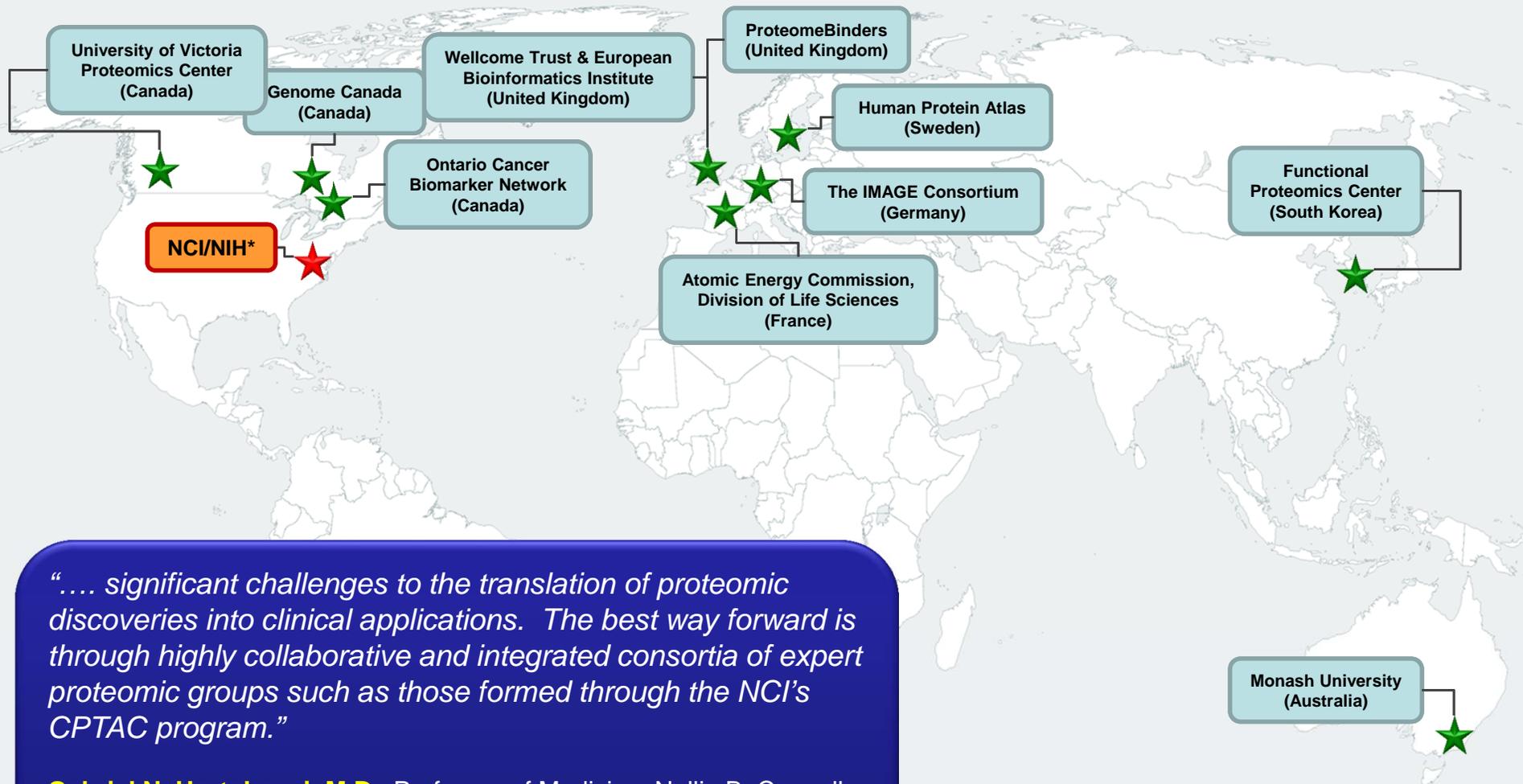


Leveraged Activities

- Foundations supporting CPTAC investigators
 - Entertainment Industry Foundation (Pfizer, TGen), Canary Foundation, Stand Up To Cancer
- NIH institutional centers taping CPTAC centers (NHLBI)
- OBBR – biospecimen research network
- Commercialization of products
- New Institute: Center For Analytical Instrumentation Development (CIAD)
- Multiple SBIR topics (bundling reagents)



CPTC – Connecting the Global Proteomics Community



“... significant challenges to the translation of proteomic discoveries into clinical applications. The best way forward is through highly collaborative and integrated consortia of expert proteomic groups such as those formed through the NCI’s CPTAC program.”

Gabriel N. Hortobagyi, M.D., Professor of Medicine; Nellie B. Connally Chair in Breast Cancer ; Chairman, Department of Breast Medical Oncology , The University of Texas M D. Anderson Cancer Center